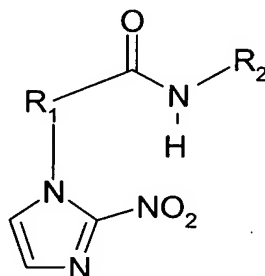


This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 - 5 (canceled)

Claim 6 (currently amended) A method for the synthesis of a [^{18}F]-labeled perfluorinated-nitroaromatic compound having the formula:



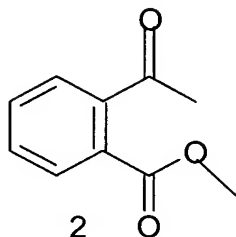
wherein R₁ is CH₂ and R₂ is an alkyl group having up to about 6 halogen atoms, wherein said alkyl group has the formula CHXCX₂CY₃ where X is halogen or hydrogen and Y is fluorine, comprising

(1) perfluorinating a first intermediate which is ~~an~~ ~~ana~~ amino acid derivative which is N-protected by an imido group or a synthetically equivalent group having a carboxyl function transformed into a dithioester function or a synthetically equivalent persulphurated moiety thereby obtaining a [^{18}F]-labeled perfluorinated amino acid derivative which is N-protected by an imido group or a synthetically equivalent group as a second intermediate and

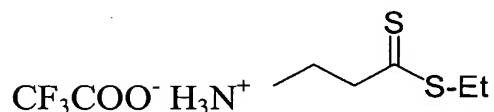
(2) deprotecting the nitrogen function of said second intermediate, resulting in a [^{18}F] labeled perfluoroalkyl amine derivative, and coupling 2-(2-nitro-imidazol-1-yl) acetic acid with a [^{18}F] labeled perfluoroalkyl amine derivative.

Claim 7 (previously presented) A method for the synthesis of a compound according to claim 6, comprising:

- a) adding a THF solution of a compound of formula 2 to a suspension of PYBOP in THF followed by Et₃N,



- b) adding an amine of formula 1 and Et₃N to the solution obtained in step (a),



- c) adding a catalytic amount to the solution obtained in step (b) of pTsOH and refluxing the solution,
- d) cooling the solution obtained after step (c) at ambient temperature and adding a sodium bicarbonate solution,
- e) extracting the product obtained after step (d) with ethyl acetate and drying and concentrating the product with ethyl acetate,
- f) purifying the residue obtained after step (e) by column chromatography on silica gel,
- g) removing traces of water by washing the product of step (f) with trifluoroacetic anhydride,
- h) reacting said a persulphurated derivative obtained from step (g) with a suitable labeled perfluorinating agent and a suitable oxidant resulting in a compound having a high yield of fluor atom incorporation,
- i) deprotecting the nitrogen function, resulting in a perfluoroalkyl amine derivative, and

j) coupling the perfluoroalkyl amine derivative obtained in step (i) with an activated form of 2-(2-nitro-imidazol-1-yl) acetic acid, resulting in the [^{18}F]-labeled ~~or~~ perfluorinated-nitroaromatic compound.

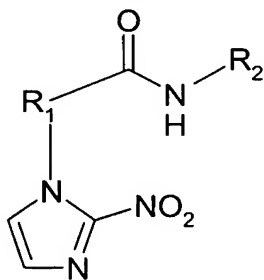
Claim 8 (original) A method according to claim 7 wherein hydrogen fluoride/pyridine complex (HF-Pyridine) is used as a perfluorinating agent and 1,3-dibromo-5,5-dimethylhydantoin (DBH) is used as an oxidant resulting in a compound having a high yield of fluor atom incorporation.

Claims 9 - 25 (canceled)

Claim 26 (previously presented) A method for the detection of tissue hypoxia in a patient comprising:

- producing according to the method of claim 6 a [^{18}F]-labeled perfluorinated-nitroaromatic compound having the formula:

wherein R_1 is CH_2 and R_2 is an alkyl group having up to about 6 halogen atoms, wherein said alkyl group has the formula $\text{CHXCX}_2\text{CY}_3$ where X is halogen or hydrogen and Y is fluorine by coupling 2-(2-nitro-imidazol-1-yl) acetic acid with a [^{18}F]-labeled perfluoroalkyl amine derivative according to the method of claim 6;

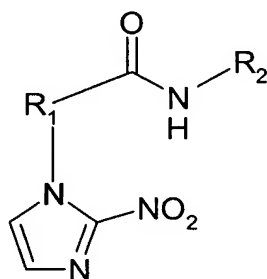


- quantifying tissue hypoxia in said patient by imaging said patient after having introduced said [^{18}F] labeled nitromidazole compound into said patient.

Claim 27 (original) A method according to claim 26 wherein the detection technique used in said method is positron emission tomography.

Claim 28 (previously presented) A method for the detection of tissue hypoxia in a tissue comprising:

- producing according to the method of claim 6 a [^{18}F]-labeled perfluorinated-nitroaromatic compound having the formula:

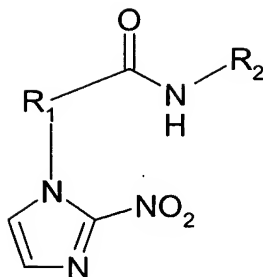


wherein R_1 is CH_2 and R_2 is an alkyl group having up to about 6 halogen atoms, wherein said alkyl group has the formula CHXCX_2 CY_3 where X is halogen or hydrogen and Y is fluorine by coupling 2-(2-nitro-imidazol-1-yl) acetic acid with a [^{18}F]-labeled perfluoroalkyl amine derivative;

- introducing said [^{18}F] labeled nitroimidazole compound of claim 6 into a patient,
- removing a tissue sample from said patient, and
- analysing the emission in said tissue sample by autoradiography.

Claim 29 (previously presented) A method for the detection of an [^{18}F] labeled bioactive compound in a patient comprising:

- producing according to the method of claim 6 a [^{18}F]-labeled perfluorinated-nitroaromatic compound having the formula:

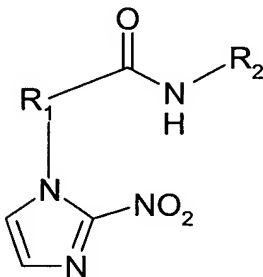


wherein R_1 is CH_2 and R_2 is an alkyl group having up to about 6 halogen atoms, wherein said alkyl group has the formula $CHXCX_2CY_3$ where X is halogen or hydrogen and Y is fluorine by coupling 2-(2-nitro-imidazol-1-yl) acetic acid with a [^{18}F]-labeled perfluoroalkyl amine derivative;

- introducing said [^{18}F] labeled bioactive compound according to claim 6 into said patient,
- imaging the presence of said [^{18}F] labeled bioactive compound in said patient, and
- optionally, quantifying the presence of said [^{18}F] labeled bioactive compound in said patient.

Claim 30 (previously presented) A method for the detection of [^{18}F] labeled bioactive compound in a tissue comprising:

- producing according to the method of claim 6 a [^{18}F]-labeled perfluorinated-nitroaromatic compound having the formula:

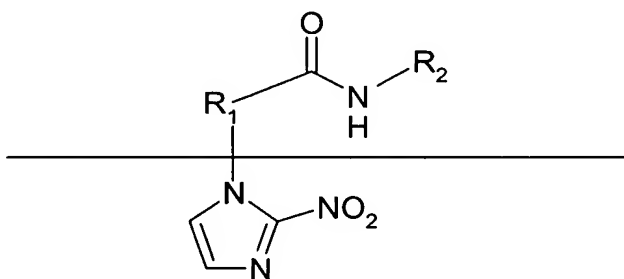


wherein R_1 is CH_2 and R_2 is an alkyl group having up to about 6 halogen atoms, wherein said alkyl group has the formula $CHXCX_2CY_3$ where X is halogen or hydrogen and Y is fluorine by coupling 2-(2-nitro-imidazol-1-yl) acetic acid with a [^{18}F]-labeled

perfluoroalkyl amine derivative;

- introducing an [^{18}F] labeled bioactive compound of claim 6 into a patient,
- taking a tissue sample from said patient, and
- analysing the emission in said tissue sample by autoradiography.

Claim 31 **(Currently Amended)** A method according to claim 6, wherein said coupling is a classical peptide coupling using a derivative of 2-(2-nitro-imidazol-1-yl) acetic acid having a in which the OH group of the carboxyl function in which OH has been replaced by a good leaving group



Claim 32 **(previously presented)** A method according to claim 6, wherein the compound has a specific radioactivity of 1 to 30 Ci/.

Claim 33 **(previously presented)** A method according to claim 6, wherein the compound has the formula 2-(2-nitro-1H-imidazol-1-yl)-N-(3,3,3-trifluoropropyl) acetamide ([^{18}F]-EF3).

Claim 34 **(previously presented)** A method according to claim 6, wherein the compound has the formula 2-(2-nitro-1H-imidazol-1-yl)-N-2,2,3,3,3-pentafluoropropyl) acetamide ([^{18}F]-EF5).

Claim 35 **(canceled)**